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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,348	01/16/2004	John Miller	TJT-13602/16	7451

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EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
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1751

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/759,348

Applicant(s)

MILLER ET AL.

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 26-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24, 26 and 28-29 is/are rejected.
- 7) ☒ Claim(s) 27 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/20/04, 04/07/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

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Detailed Action

- The amendment filed 01/03/2005 in response to the Election/Restriction requirement mailed 11/04/2004 has been entered. Claims 1-24 and 26-30 are currently pending with the application.
- The IDS filed 04/07/2004 and 12/20/2004 have been considered by the examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-9, 13 and 17-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Clerc et al (US 6,524,744).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR

1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Clerc et al teach an anode of Li-ion battery comprising a ceramic matrix of transitional metal nitrides and a second phase active material of a nanoparticle dispersion of at least one material selected from Sn and Sb that meets the limitations of Claims 1, 3-5, 7-9, 13 and 21-24 (Col-4, Claims 1-4; Col-3, Ln 27-59). The composition of the anode material satisfies the formula $T_xA_{1-x}B_yO_z$, wherein T-Group IV-VI transition metal; A- Sn, Sb; B-C, N; $x=0.4-0.6$, $y=0.2-0.6$, $z=0-0.3$, that meets the limitation of the composition in claim-2. With regard to claims 6 and 10, the nanophase compositions of the prior art are identical to those claimed by the applicants, and identical compositions have identical properties.

All the limitations of the instant claims are met.

The reference is anticipatory.

2. Claims 1-5, 7-8, 10-23 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Sato et al (US 6,544,687).

Sato et al teach a negative electrode comprising a solid solution with the composition satisfying the formula $Li_xM^1_yM^2_z$ wherein M^1 -Ti, Zr, Mn, Co, Ni, Cu and Fe, and M^2 -Si and/or Sn, $0 \leq x < 10$, $0.1 \leq y \leq 10$, and $z=1$ that meets the limitations of claims 1-4 and 21-22 (Col-2, Ln 7-24).

With regard to Claims 5 and 7, the prior art teaches intermetallics with a crystal grain size of 0.05-0.13 microns <50-130nm> (Col-2, Ln 20).

With regard to Claims 8 and 23, the prior art teaches an electrode containing the intermetallics compounded with carbon (Col-2, Ln 21-24).

With regard to claim-10, the electrode composite is a nanophase matrix wherein the prior art composition is identical to that claimed by the applicants, and identical compositions have identical properties. Further, the carbon black is a nanophase material with a particle size of 0.3-120 nm as shown by Weth et al (J. Porous. Matl., 2001, 8(4), Pg 319-325; Abstract).

With regard to claims 11-14, the prior art teaches carbon material to be graphite, acetylene black and low crystalline carbon material (Col-4, Ln 6-8).

With regard to claims 15-16, the prior art teaches FeSn₂ electrode material (Col-3, Ln 46-64, Col-6, Table-1).

With regard to claims 17-20, the claims are drawn to composition it-self.

With regard to Claim 26, the prior art reaches making the solid solution by milling the components that are identical to those claimed by the applicants in a ball mill and under inert atmosphere that meets the limitation of mechanical-alloying in the claim (Col-5, Ln 26-37).

All the limitations of the instant claims are met.

The reference is anticipatory.

3. Claims 1-5, 7-8, 10-23 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al (WO 01/03210).

Sato et al (US 6,544,687) is being used as the exact English translation of Sato et al (WO 01/03210) in the present rejection.

Sato et al teach a negative electrode comprising a solid solution with the composition satisfying the formula $\text{Li}_x\text{M}^1_y\text{M}^2_z$ wherein M^1 -Ti, Zr, Mn, Co, Ni, Cu and Fe, and M^2 -Si and/or Sn, $0 \leq x < 10$, $0.1 \leq y \leq 10$, and $z=1$ that meets the limitations of claims 1-4 and 21-22 {(US: Col-2, Ln 7-24), WO: Pg-2} .

With regard to Claims 5 and 7, the prior art teaches intermetallics with a crystal grain size of 0.05-0.13 microns <50-130nm> {US: (Col-2, Ln 20), WO: Pg-2}}.

With regard to Claims 8 and 23, the prior art teaches an electrode containing the intermetallics compounded with carbon {(US:Col-2, Ln 21-24), WO: Pg-2}}.

With regard to claim-10, the electrode composite is a nanophase matrix wherein the prior art composition is identical to that claimed by the applicants, and identical compositions have identical properties. Further, the carbon black is a nanophase material with a particle size of 0.3-120 nm as shown by Weth et al (J. Porous. Matl., 2001, 8(4), Pg 319-325; Abstract).

With regard to claims 11-14, the prior art teaches carbon material to be graphite, acetylene black and low crystalline carbon material {(US:Col-4, Ln 6-8), WO: Pg-6}}.

With regard to claims 15-16, the prior art teaches FeSn_2 electrode material {(US:Col-3, Ln 46-64, Col-6, Table-1), WO: Pg-5}}.

With regard to claims 17-20, the claims are drawn to composition it-self.

With regard to Claim 26, the prior art reaches making the solid solution by milling the components that are identical to those claimed by the applicants in a ball mill and under inert atmosphere that meets the limitation of mechanical-alloying in the claim {(US:Col-5, Ln 26-37), WO:Pg-8}}.

All the limitations of the instant claims are met.

The reference is anticipatory.

4. Claims 1, 3-4, 8 and 15-23 rejected under 35 U.S.C. 102(b) as being anticipated by Ikeda et al (US 6,492,063).

Ikeda et al teach a poly-phase negative electrode comprising of two different intermetallic phases A and B, and C being a constituent element of A or B. The intermetallics A and B were solid solutions of Al and Mo, Sn and Sb, Sn and Fe such as FeSn_2 , Sn and Cu, Sn and Co, Sn and Ag, Si and Ca, Si and Mg, Mg and Ge, and this meets the limitations of claims 1, 3-4, 8, 15-23 (Abstract, Col-2, Ln 21-32, Col-3, Ln 6-18, Col-4, 29-30). All the limitations of the instant claims are met.

The reference is anticipatory.

5. Claims 1, 3-5, 7-11, 13 and 17-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Sato et al (US 6,824,921).

Sato et al teach a negative electrode material for a non-aqueous electrolyte secondary battery comprising: at least one nitride of an element (A) selected from the group A consisting of Ce, Co, Cr, Fe, La, Mn, Mo, Nb, P, Sc, Sr, Ta, Ti, V, Y, Yb, Zr, B, Ca, Mg, Na and Zn; and at least one substance of an element (B) selected from the group B consisting of Ge, Sn, Pb and Bi; wherein the average crystal grain size of said nitride is 0.001 to 0.1 microns that meets the limitation of claims 1, 3-4, 7-10, 13 and 17-24.

With regard to claims 5 and 11, the prior art discloses the electrode composition to be amorphous with particle size to be about 0.7 microns (Col-8, Ln 62-66). All the limitations of the instant claims are met.

The reference is anticipatory.

6. Claims 26 and 28-29 rejected under 35 U.S.C. 102(b) as being anticipated by Yoshimura et al (Scripta Mater, 2001, 44, Pg 1517-1521).

Yoshimura et al disclose forming a Si₃N₄-TiN nanophase composite by milling silicon nitride and metallic Ti in N₂ by mechano-chemical grinding that meets the limitations of the instant claims (Pg 1518-1519, Results and discussion). All the limitations of the instant claims are met.

The reference is anticipatory.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 21-24 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 6,524,744. Although the conflicting claims are not identical, they are not patentably distinct from each other because both the US Patent and the instant application encompass similar electrode/anode materials, while the instant application differs from the Patent wherein the application claims an electrode and the Patent claims a lithium ion battery containing the anode with nanodispersed matrix.

Allowable Subject Matter

Claims 27 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record neither teaches nor fairly suggestive of the method steps involving two mechanical alloying steps and alloying with a fourth element meeting the limitations of the instant claims by the applicants.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on M-Th, 07.00 - 16.30 hrs, Alt. Fri: 07.00-15.30 hrs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMV
March 14, 2005.


Mark Kopec
Primary Examiner